

1. John bought a new bicycle. He paid 15% less than the original price of \$195.00. What was the cost of the bicycle John bought?

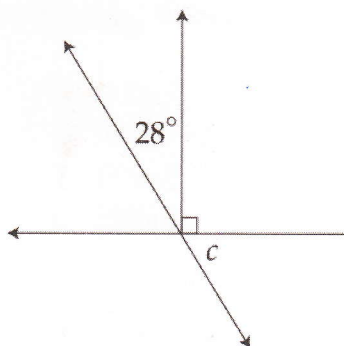
A \$180.00  
B \$29.25  
C \$224.25  
D \$165.75

$$100\% - 15\% = 85\%$$

$$195 \cdot 0.85 = 165.75$$

$$195 \cdot 0.85 = 165.75$$

2. What is the value of  $c$ ? (Note: The figure is not drawn to scale.)



A  $28^\circ$   
B  $62^\circ$   
C  $90^\circ$   
D  $118^\circ$

$$90^\circ + 28^\circ = 118^\circ$$

$$180^\circ - 118^\circ = 62^\circ$$

$$90^\circ + 28^\circ = 118^\circ$$

$$180^\circ - 118^\circ = 62^\circ$$

3. Eva wants to build a fence around her circular garden. If the garden's radius is 12 ft, what is the best estimate for the length of the fence?





A 19 ft  
B 24 ft  
C 38 ft  
D 75 ft

$$L = \pi d = 3.14 \cdot 12 = 37.68$$

$$L = \pi d = 3.14 \cdot 12 = 37.68 \text{ ft}$$

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4. What is the function rule  $f(n)$  for finding the number of circles in the  $n$ th figure in the sequence below?

Figure				
Figure Number	$n = 1$	$n = 2$	$n = 3$	$n = 4$

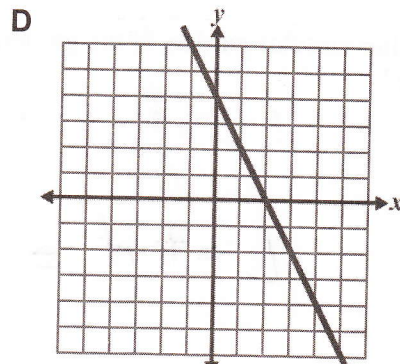
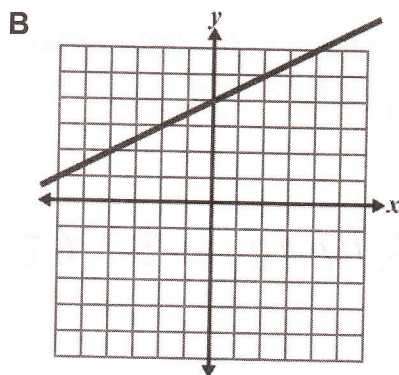
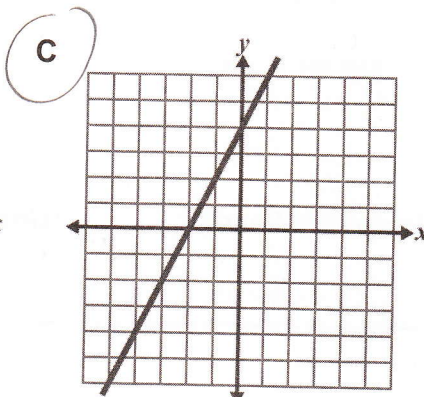
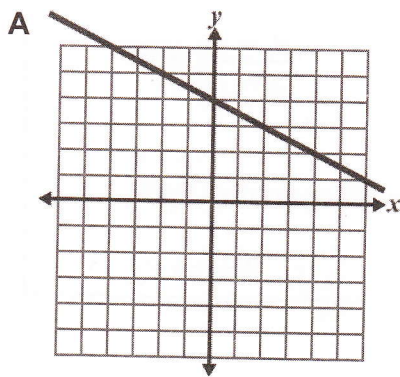
A  $f(n) = n - 1$

B  $f(n) = 3n - n$

**C**  $f(n) = 2n - 1$

D  $f(n) = n^2 - n$

5. Which of these is the graph of the line  $y = 2x + 4$ ?



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6. Evaluate the following expression.

$$15 - (7 - 4)^2 \times 3$$

- ☒ A -12  
☐ B 12  
☐ C 18  
☐ D 36

$$15 - 3^2 \times 3 = 15 - 9 \cdot 3 = 15 - 27 = -12$$

$$15 - 3^2 \times 3 = 15 - 9 \cdot 3 = 15 - 27 = -12$$

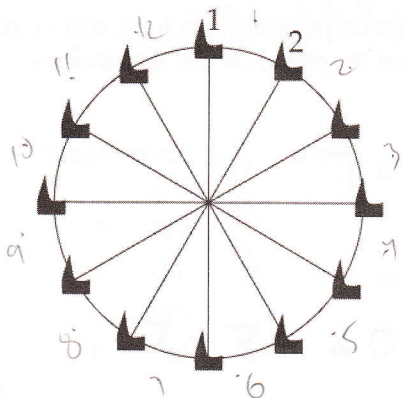
7. Grace has a jewelry box shaped like a regular prism. The dimensions of the box are 13 inches by 7 inches by 8 inches. What is the volume of the jewelry box?

- ☐ A 243in.<sup>3</sup>  
☐ B 502in.<sup>3</sup>  
☐ C 637in.<sup>3</sup>  
☒ D 728in.<sup>3</sup>

$$13 \cdot 7 \times 8 = 728$$

$$13 \cdot 7 \cdot 8 = 728$$

8. A Ferris wheel with a diameter of 72 ft has 12 cars spaced evenly around its circumference. The diagram below shows the position of two adjacent cars.



$$L = \pi d = 3.14 \cdot 72 = 226.08$$

$$226.08 \div 12 = 18.84 \approx 19$$

$$L = \pi d = 3.14 \cdot 72 = 226.08 \text{ ft}$$

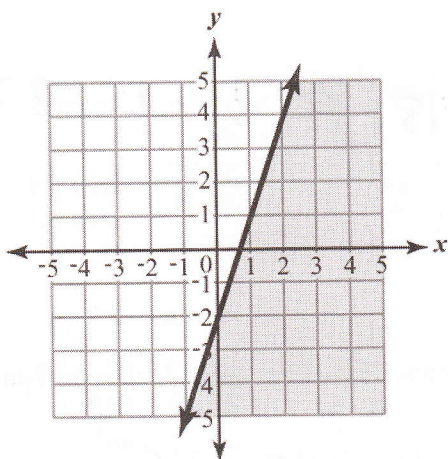
$$226.08 \div 12 = 18.84 \approx 19 \text{ ft}$$

To the nearest foot, what is the length of the minor arc separating the two cars?

- ☐ A 6 ft  
☒ B 19 ft  
☐ C 38 ft  
☐ D 226 ft

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9. Look at this graph.



Which inequality is represented by the graph?

- A  $3x \leq y + 2$
- B  $3x > y + 2$
- ☒ C  $3x \geq y + 2$
- D  $3x < y + 2$

Handwritten work for Question 9:

$$y \leq 3x - 2$$

$$y - 3x \leq -2$$

$$-3x$$

$$y - 3x \leq -2$$

$$-y$$

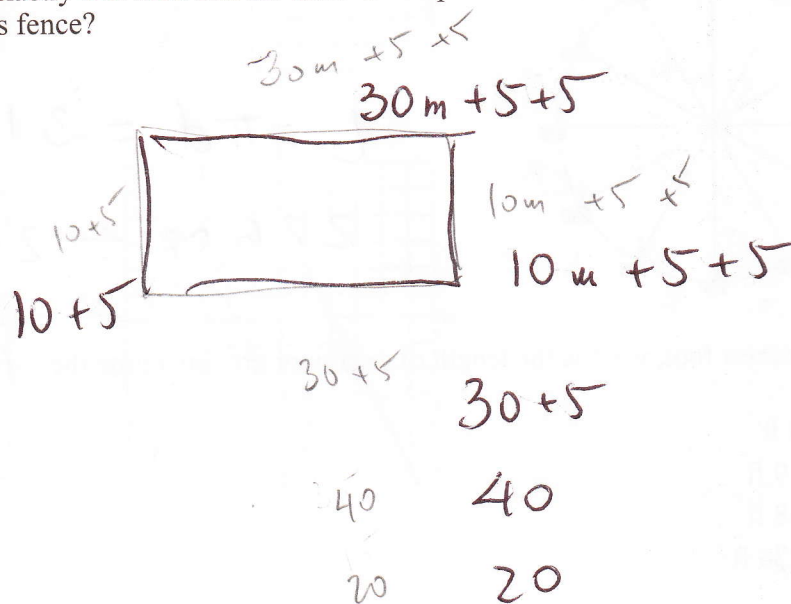
$$-3x \leq -y - 2$$

multiply by -1

$$3x \geq y + 2$$

10. Mr. Barnes wants to build a fence around a swimming pool. The rectangular pool is 30 m long and 10 m wide, and he wants to have exactly 5 m between the sides of the pool and the fence. What dimensions should Mr. Barnes use for his fence?

- A length = 20 m  
width = 10 m
- B length = 25 m  
width = 5 m
- C length = 35 m  
width = 15 m
- ☒ D length = 40 m  
width = 20 m



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11. A line through points  $(1, n)$  and  $(-1, -3)$  has a slope of 3. What is the value of  $n$ ?

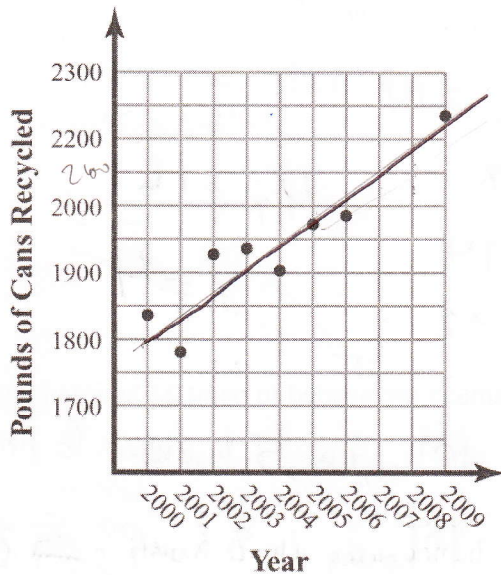
A -5  
☒ B -3  
 C 3  
 D 5

$$3 = \frac{-3 - n}{-1 - 1} \quad ; \quad 3 = \frac{-3 - n}{-2}$$

$$-6 = -3 - n$$

$$+3 \quad +3 \quad n = -3$$

12. Look at the scatter plot.

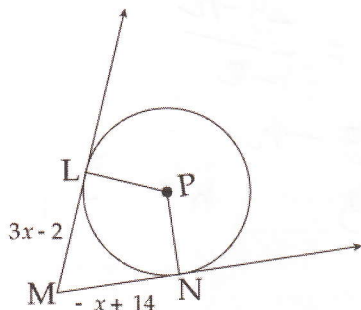


Based on the graph, which is a reasonable estimation of how many pounds of cans were recycled in 2008?

A 1980 —  
☒ B 1930 —  
 C 2025 —  
 D 2300 —

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13. In the figure below,  $\overline{MN}$  is tangent to circle P at point N, and  $\overline{ML}$  is tangent to circle P at point L.



What is the value of  $x$ ?

- A 4
- B 6
- C 9
- D 12

$$3x - 2 = -x + 14$$

$$+x \quad +x$$

$$4x - 2 = 14$$

$$+2 \quad +2$$

$$3x - 2 = -x + 14$$

$$+x \quad +x$$

$$4x - 2 = 14$$

$$+2 \quad +2$$

$$4x = 16$$

$$x = 4$$

$$4x = 16$$

$$x = 4$$

14. Six painters can paint 10 houses in five hours. How many painters are needed to paint 24 houses in eight hours?

- A 3
- B 6
- C 9
- D 15

10 in 5 hours 6 paint.  
10 in 8 h. 3.75

$$\frac{5}{8} \cdot 6 =$$

$$3.75 \cdot 4 = 15$$

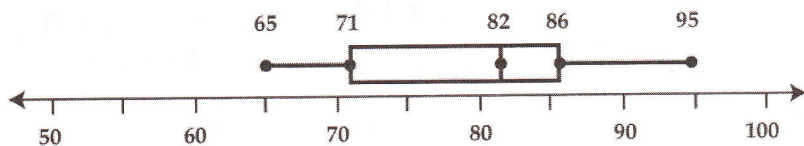
10 houses in 5 hours 6 painters

10 houses in 8 hours  $\rightarrow$  3.75 paint

$$6 \cdot \frac{5}{8}$$

$$3.75 \cdot 2.4 = 9$$

15. The box-and-whisker plot below shows the scores a class received on a recent science project. What is the interquartile range?



- A 6
- B 15
- C 17
- D 30

$$86 - 71 = 15$$

$$86 - 71 = 15$$

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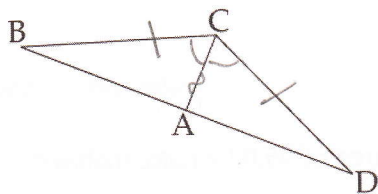
16.  $7[3^2 - 2(1+2)] \div 7 + 5^2 =$

- A 25
- B 26
- ☒ C 28
- D 30

$$\begin{aligned} &7(9 - 2 \cdot 3) \div 7 + 25 \\ &7(9 - 6) \div 7 + 25 \\ &7 \cdot 3 \div 7 + 25 \\ &21 \div 7 + 25 \\ &3 + 25 = 28 \end{aligned}$$

$$\begin{aligned} &7(9 - 2 \cdot 3) \div 7 + 25 \\ &7(9 - 6) \div 7 + 25 \\ &7 \cdot 3 \div 7 + 25 \\ &21 \div 7 + 25 \\ &3 + 25 = 28 \end{aligned}$$

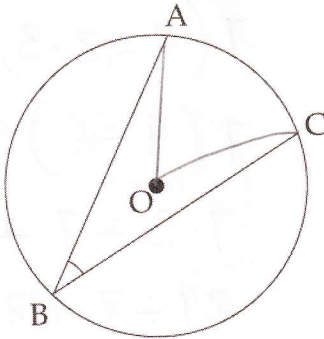
17. In the figure below,  $\overline{CD} \cong \overline{CB}$  and  $\angle ACD \cong \angle ACB$ . Which congruence shortcut could you use to show that  $\triangle ACD \cong \triangle ACB$ ?



- A AAA
- B SSA
- C SSS
- ☒ D SAS

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18. The measure of  $\angle ABC = 30^\circ$ . What is the measure of  $\widehat{AC}$ ?

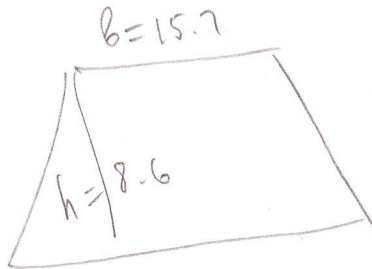


- A  $15^\circ$   
B  $30^\circ$   
C  $45^\circ$   
D  $60^\circ$

19. A trapezoid has a height of 8.6 inches, one base of 15.7 inches and an area of 95.03 square inches.

What is the length of the other base rounded to the nearest tenth?

- A 67.5 inches  
B 6.4 inches  
C 15.7 inches  
D 5.7 inches



$$95.03 = \left( \frac{15.7 + x}{2} \right) \cdot 8.6$$

$$\frac{95.03}{4.3} = \frac{(15.7 + x) \cdot 4.3}{4.3}$$

$$22.1 = 15.7 + x$$

$$x = 6.4$$

$$95.03 = \frac{(15.7 + x) \cdot 8.6}{2}$$

$$\frac{95.03}{4.3} = \frac{(15.7 + x) \cdot 4.3}{4.3}$$

$$22.1 = 15.7 + x$$

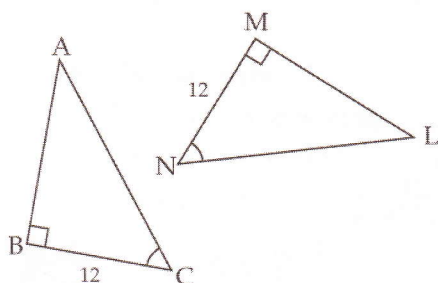
$$-15.7$$

$$x = 6.4$$

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20. Which congruence shortcut could you use to show that  $\triangle ABC$  is congruent to  $\triangle LMN$ ?



- A SAS
- B SSS
- ☒ C ASA
- D SSA

21. Look at this equation.

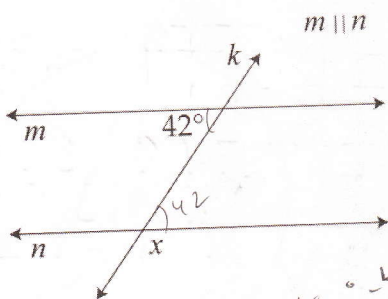
$$6x + 8 = 26$$

Which of these sets of operations would solve the equation?

- ☒ A subtract 8 from both sides and divide both sides by 6
- B divide both sides by 6 and subtract 8 from both sides
- C subtract 8 from both sides and multiply both sides by 6
- D divide both sides by 8 and subtract 6 from both sides

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22. What is the value of  $x$ ?



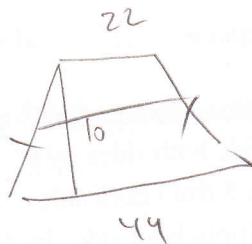
$$180^\circ - 42^\circ = 138^\circ$$

- A  $42^\circ$   
B  $48^\circ$   
C  $132^\circ$   
D  $138^\circ$

$$180^\circ - 42^\circ = 138^\circ$$

23. An isosceles trapezoid has a height of 10 cm, and bases measuring 22 cm and 44 cm. What is the length of the midsegment of this trapezoid?

- A 33 cm  
B 66 cm  
C 165 cm  
D 330 cm



$$\frac{22 + 44}{2} = 33$$

$$\frac{22 + 44}{2} = 33 \text{ cm}$$

24. Which set of points represents a function?

- A  $(2, 5), (3, 8), (4, 3), (1, 5), (0, 7), (6, 2)$  ✓  
B  $(1, 1), (1, 2), (1, 3), (3, 1), (3, 2), (3, 3)$   
C  $(-1, -1), (-2, 5), (-5, 4), (-5, 3), (4, 7), (7, 9)$   
D  $(2, 5), (6, 4), (4, 4), (2, 7), (8, 1), (4, 4)$

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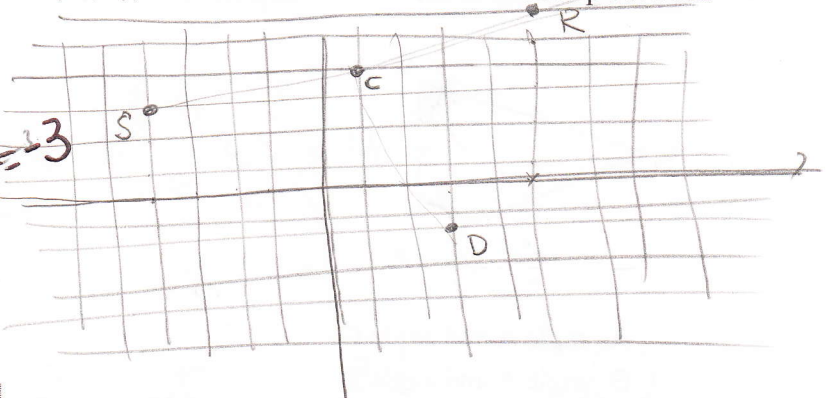
25. Given the points C(1, 4), D(3, -2), R(5, 6), and S(-4, 3), which **best** describes the relationship between  $\overline{CD}$  and  $\overline{RS}$ ?

- A They are parallel.  
☒ B They are perpendicular.  
 C They are the same line.  
 D They are skew.

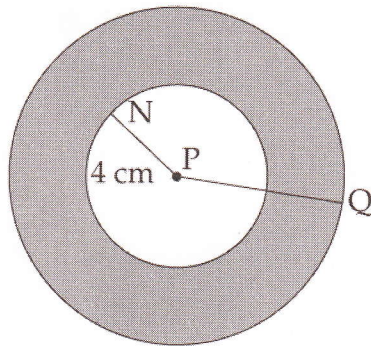
$$m_{RS} = \frac{3-6}{-4-5} = \frac{-3}{-9} = \frac{1}{3}$$

$$m_{CD} = \frac{-2-4}{3-1} = \frac{-6}{2} = -3$$

$$m_1 = -\frac{1}{m_2}$$



26. In the diagram below, NP = 4 cm and NP =  $\frac{1}{2}$  PQ. What is the area of the shaded region to the nearest square centimeter?



- A 25cm<sup>2</sup>  
 B 50cm<sup>2</sup>  
☒ C 151cm<sup>2</sup>  
 D 201cm<sup>2</sup>

$$PQ = 8$$

$$\pi R^2 - \pi r^2 = \pi (R^2 - r^2) = \pi (8^2 - 4^2) =$$

$$= 3.14 (64 - 16) = 150.72 \approx 151$$

$$PQ = 8$$

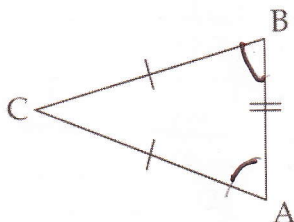
$$\pi R^2 - \pi r^2 = \pi (R^2 - r^2) =$$

$$= \pi (8^2 - 4^2) = 3.14 (64 - 16) =$$

$$= 150.72 \approx 151 \text{ cm}^2$$

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27. What are the base angles of triangle ABC?



- ☐ A angle A and angle C
- ☒ B angle A and angle B
- ☐ C angle B and angle C
- ☐ D only angle C

28. What is the slope of  $f(x) = \frac{1}{2}x - 3$ ?

- ☐ A  $-\frac{3}{2}$
- ☐ B 2
- ☒ C  $\frac{1}{2}$
- ☐ D -3

29. What is the midpoint of the line segment that connects point A (-1, 2) and point B (5, -4)?

- ☐ A (4, -1)
- ☐ B (4, -2)
- ☐ C (2, -2)
- ☒ D (2, -1)

$$x_{AB} = \frac{-1+5}{2} = \frac{4}{2} = 2$$

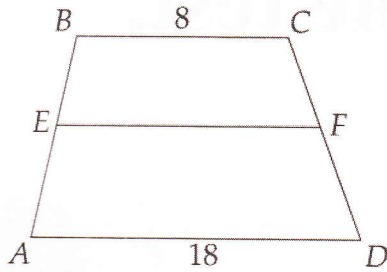
$$y_{AB} = \frac{2+(-4)}{2} = \frac{-2}{2} = -1$$

$$x_{AB} = \frac{-1+5}{2} = \frac{4}{2} = 2 ; y_{AB} = \frac{2+(-4)}{2} = \frac{-2}{2} = -1$$

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30. In the trapezoid below, E and F are midpoints of  $\overline{AB}$  and  $\overline{DC}$ , respectively. What is the length of  $\overline{EF}$ ?  
(Note: The figure is **not** drawn to scale.)



- A 8
- B 10
- C 13**
- D 26

$$\frac{8 + 18}{2} = \frac{26}{2} = 13$$

$$\frac{8 + 18}{2} = \frac{26}{2} = 13$$